

# Disability Group Meeting

Charleston, South Carolina

February 12-15, 2004

David Cutler and David Wise, Organizers

Thursday, February 12

7PM Dinner at Charleston Grill (transportation to and from the hotel has been arranged. Please meet in the lobby at 6:30PM)

Friday, February 13

## A) Taking Stock

8:30 – 9:15AM

Disparities in Trends in Old-Age Disability: 1982-2001

*Bob Schoeni, University of Michigan*

*Vicki Freedman, Polisher Research Institute*

*Linda Martin, Population Council*

9:15 – 10:00AM

Pathways to Disability

*Axel Boersch-Supan, University of Mannheim and NBER*

*Michael Hurd, SUNY Stony Brook, RAND and NBER*

*David Wise, Harvard University and NBER*

*Florian Heiss, University of Mannheim*

10:00 – 10:45AM

Pathways to Disability

*Mary Beth Landrum, Harvard Medical School*

*Kate Stewart, Harvard University*

10:45 – 11:00AM

BREAK

11:00 – 11:45AM

An International Comparison of Work Disability

*James Banks, Institute for Fiscal Studies*

*Arie Kapteyn, RAND*

*Jim Smith, RAND*

*Arthur van Soest, RAND*

## **B) Explanations for Changing Disability**

11:45AM – 12:30PM

Cardiovascular Disease and Disability

*David Cutler, Harvard University and NBER*

12:30 – 1:30PM

LUNCH

1:30 – 2:15PM

The Impact Of Depression On Older Worker: Disability Program Participation, Work Effort and Retirement

*Richard Frank, Harvard University and NBER*

*Ernie Berndt, MIT and NBER*

*Rena Conti, Harvard Medical School*

2:15 – 3:00PM Risk

Are Baby Boomers Aging Better or Just Longer? Musculoskeletal Factors for Disability

*Lisa Iezzoni, Harvard Medical School*

*Suzanne Leveille, Hebrew Rehabilitation Center for Aged*

- 3:00 – 3:15PM                   BREAK
- 3:15 – 4:00PM                   The Effect of Disabling Illness or Death in One Spouse of the Mortality of the Other  
*Nicholas Christakis, Harvard Medical School*  
*Paul Allison, University of Pennsylvania*
- 4:00 – 4:45PM                   The Historical Record Part I. Heart, Joints, and Mind: Why Were Older Men in the Past in Such Poor Health? Part II. Arthritis: The Evolution of its Prevalence, 19th and 20th Centuries  
*Dora Costa, MIT and NBER*  
*Robert Fogel, University of Chicago and NBER*  
*Paula Canavese, University of Chicago*

Saturday, February 14

- 8:30 – 9:15AM                   Technological Aids  
*Linda Martin, Population Council*  
*Vicki Freedman, Polisher Research Institute*  
*Emily Agree, Johns Hopkins Bloomberg School of Public Health*

**C) Implications**

- 9:15 – 10:00AM                   Disability and Health Care Expenditures among Medicare Beneficiaries  
*Mike Chernew, University of Michigan and NBER*  
*Dana Goldman, RAND and NBER*  
*(Joint with Feng Pan, University of Michigan, and Baoping Shang, RAND)*
- 10:00 – 10:15AM                   BREAK
- 10:15 – 11:00AM                   Disability and Labor Supply over the Life Cycle  
*Andrew Samwick, Dartmouth College and NBER*  
*Amitabh Chandra, Dartmouth College and NBER*
- 11:00 – 11:45AM                   Are the Near Elderly Getting Healthier? Reconciling the Conflicting Evidence  
*Mark Duggan, University of Maryland and NBER Scott Imberman, University of Maryland*
- 11:45 – 12:30PM                   Wrap-up

The NBER project on Disability is funded by the National Institute on Aging. Additional funding provided by the Mary Woodward Lasker Charitable Trust.

# THE FOUNDATIONS OF DISABILITY DECLINE<sup>1</sup>

NBER Progress Report  
October 2004

## Introduction

An accumulating body of research has identified significant and ongoing improvements over time in the functional ability of older people, both in the United States and throughout the world. The implications of declining disability are enormous, and measurable in both social and economic terms. The substantive focus of the NIA-Lasker project at the NBER is to understand the foundations of disability decline, what might be done to extend and even accelerate future improvements in functional ability, and how the benefits of disability decline can be evaluated and quantified in economic terms. Why is this so important?

- ***The Quality of Later Life.*** People are living longer than at any time in history. But will those increased years of life be characterized by functional disability or functional independence? Declining disability into the future will assure not just more years of life, but a better quality of later life.
- ***Population Aging.*** In addition to living longer as individuals, the “baby boom” generation is approaching retirement age. Thus the fastest growing population groups in the future will be the oldest – those in their 70s, 80s and 90s. Declining disability will moderate the economic and social challenges of a growing older population.
- ***Disability and Work.*** Disability is a major reason that people retire from the labor force. Disability declines will enable people to work longer, earn income longer, and contribute longer to the economic productivity of the labor market.
- ***Caregiving.*** Informal caregiving within families, formal long-term care services, and residential care in nursing homes and other long-term care facilities together represent a major cost of disability. Declining disability will reduce all of the social, psychological and economic costs associated with caregiving.
- ***Medical Care.*** The amount spent on medical care for individuals with disabilities is several times larger, on average, than the amount spent on medical care for those without disabilities. While many factors will play into future medical care costs in the United States, future disability rates are one piece of the equation. Medical advances and medical spending also have an important role in causing reductions in disability.

The value of functional health to individuals, caregivers, society and the economy would be hard to overstate. By understanding the root causes of past disability decline, one can begin to look forward at likely future disability trends, and factors that might stimulate further improvements in functional ability going forward. One can also begin to quantify the value of disability decline, which encompasses all of these benefits: better quality of life, the ability to work and earn income longer, and the potential savings in caregiving and medical costs.

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<sup>1</sup> This collaborative research effort is funded by the National Institute on Aging (NIA).

## **Project Overview**

With support from the National Institute on Aging (and the Mary Woodard Lasker Charitable Trust-proposed), the NBER has been able to assemble a team of leading researchers on disability. The group includes economists, demographers, epidemiologists, and physicians. Their goal is to work collaboratively to better understand the causes and characteristics of past disability trends, to identify the core foundations of disability decline, and to think about how functional ability might continue to be improved into the future. Continuing work will also be directed toward evaluating and quantifying the economic benefits of disability decline.

The group has been meeting regularly for the past two years, establishing an integrated research agenda for the program, completing an initial round of studies, and highlighting the many causal factors that have worked together to improve functional independence in the population. Critical to the project is its multi-faceted approach. The improved ability of individuals to function independently in later life is a result of many factors. Each has contributed to disability trends, but their relative importance, their implications for different disabling conditions, and how they all work together is less well known.

Among the factors contributing to disability trends are improvements in the diagnosis, prevention and treatment of disabling illnesses; improved management of the disabling effects of chronic illness; improved treatment of mental illness; improvements in cognitive health; pharmaceutical innovations; healthier lifestyles and health-related behaviors; decreases in hazardous exposures and improved workplace safety; the emergence of a continuum of living arrangement options; improved and more widespread use of assistive devices and technologies that enable people to function more effectively with disabling conditions; improved and expanded environmental accommodations and social systems to support older and functionally disabled people; and societal changes that make physical and mental disabilities less of an impediment to independence.

The strong relationship between education and functional ability is also clear, suggesting an important role of education in preventing or deferring disability. In short, the factors contributing to disability decline are a complex combination of physiological, medical, economic, social and environmental influences.

The goal of the project is to study these related influences in a unified and cohesive way. By drawing on a large collaborative working group, each of the individual research projects helps to inform the others. The result is a deeper and more comprehensive understanding of disability than would be possible from more isolated investigations.

## **Research Strategies and Projects**

Because of the complexity of the issue, an important initial objective of the project was to somehow organize the questions, and to lay out a research agenda for the overall program. Five research strategies were identified: (1) Characterizing Disability Decline, (2) Pathways to Disability, (3) Health Conditions that Lead to Disability, and (4) Economic and Labor Market Implications of Disability Decline. The first major phase of the project has produced 15 inter-related studies, using a mix of these four analytical approaches.

***Characterizing Disability Decline.*** The importance of characterizing disability decline was evident from the differences in measured disability trends across different surveys. We realized that different surveys were in fact measuring different aspects of what we mean by disability. From one perspective,

we were measuring disability as basic physiological function. From another, we were measuring the ability of individuals to apply their physiological ability, in coordination with assistive devices, medical management, and social and environmental supports – to accomplish the necessary activities of daily living. And from a third perspective, we were focused on the functional ability of individuals to work productively in the labor force. Each measure means something a little bit different, and points to the complexity of what we mean by “disability.” Thus one direction of project research has sought to better characterize disability in its many dimensions, and how disability rates are changing over time.<sup>2</sup>

This component of our research agenda is also looking at how disability rates vary across population groups. For example, educational attainment is found to be highly correlated with disability rates. Since the percentages of the population completing high school, going to college, completing college, and pursuing degrees beyond college has increased steadily throughout the last century, the likely implication is that this will result in continuing disability declines into the future, as more well-educated population groups reach older ages. More generally, the project has looked at disparities in disability rates across the population, often finding that groups that already have better functional health are also improving the fastest.

Highlights from our initial research in this area include:

- Arie Kapteyn, James Smith and Arthur van Soest find that there are substantial differences in self-reported health scales across countries, and across population groups within countries – that have nothing to do with more objective measures of health. For example, they find that Americans are four times more likely to state that they are in excellent health than the Dutch – a discrepancy that could not possibly result from differences in actual health status between the two populations. Using a new research technique known as “vignettes,” in which respondents are asked to evaluate the health of a hypothetical person described in the survey, the investigators were able to correct for at least some of these differences in response scales. Similar differences in response scales were found within countries, based on gender, education and age.<sup>3</sup>
- Robert Schoeni, Vicki Freedman, and Linda Martin compare disability trends across population subgroups from 1982 to 2002. They find that disability rates have declined among all major socioeconomic and demographic groups, but by differing magnitudes. For example, the decline in disability rates for those with a college degree was 2.5 percent annually, while the decline for those with less than 8 years of education was 0.9 percent annually. The decline for those in the highest income quartile was 3.1 percent annually, compared with 1.4 percent in the lowest income quartile. The decline for married people was 4.0 percent annually, while the decline for singles was 1.4 percent annually. And the decline in disability at younger ages (70-74) was 2.8 percent annually, while the decline at older ages (85+) was 1.1 percent.<sup>4</sup>
- Vicki Freedman, Linda Martin, Jennifer Cornman, Emily Agree and Robert Schoeni find substantial increases in the independent use of assistive technology (without help). In general, similar trends are found across demographic groups. However, the use of assistive technology

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<sup>2</sup> Freedman, Vicki et al, “Resolving Inconsistencies in Old-Age Disability Trends: Report from a Technical Working Group,” Demography, 2004.

<sup>3</sup> Kapteyn, Arie, James Smith and Arthur van Soest, “Self-Reported Work Disability in the U.S. and the Netherlands,” Working Paper, September 2004.

<sup>4</sup> Schoeni, Robert, Vicki Freedman and Linda Martin, “Socioeconomic and Demographic Disparities in Trends in Old-Age Disability,” Working Paper, September 2004.

for bathing, without other assistance, has increased only for more education population groups. This points again to the unique influence of education as a contributing factor in disability trends.<sup>5</sup>

***Pathways to Disability.*** A second line of research has focused on the pathways through which individuals become disabled. A common framework for understanding pathways to disability is from an identifiable health condition that may develop over time to a physiological limitation to an inability to perform one or more activities of functional independence. By focusing on the pathway, one can also isolate points along the pathway where interventions might make a difference. For example, one may effectively reduce disabilities anywhere along the pathway – by prevention of adverse health condition and events, by early diagnosis, through medical treatment of the condition, through treatment of symptoms, through the technological development and use of effective assistive devices, or through social and environmental supports that enable independent functioning despite a physiological limitation.

But one is better positioned to identify the most efficient interventions if one knows the pathways through which disabilities develop. So our research has tried to identify those pathways to disability that are most common, as well as the broader distribution of health pathways across healthy and less healthy circumstances. This can be done looking forward or backward in time. For example, what is the likelihood that a person in excellent health at age 60 will become disabled by age 70, or 80, or 90; and how do these probabilities compare with someone who was in fair health at age 60? Or what is the likelihood that someone with a particular health condition at age 75 was in poor, fair, good or excellent health at age 55? As with other lines of our research, an important finding is the significant variation in pathways to disability across individuals with different education backgrounds, different incomes or wealth, or between those who are married and those who are single. Highlights from our initial research in this area include:

- Florian Heiss, Axel Boersch-Supan, Michael Hurd and David Wise find that differences in self-reported health at any age lead to dramatic differences in the likelihood of developing a disability subsequently. This finding parallels the strong relationship between self-reported health and subsequent mortality. They also find substantial differences in the pathways to disability among those with more and less education; as functional disability is much less likely to be developed over time among those with higher levels of education.<sup>6</sup>
- Mary Beth Landrum and Kate Stewart have identified some of the most common clinical pathways into disability. A consistent finding in their research is that dementia is a leading precursor to disability. Other chronic and acute conditions that often lead to disability included cardiovascular disease (particularly heart failure and stroke), fractures, Parkinson's disease and arthritis. They also compare the relative importance of conditions that may be less common, but have a major impact on disability, such as dementia; with conditions that are more common, but have a smaller impact on disability, such as arthritis.<sup>7</sup>

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<sup>5</sup> Freedman, Vicki, Linda Martin, Jennifer Cornman, Emily Agree and Robert Schoeni, "Trends in Assistance with Daily Activities: Socioeconomic Disparities in the U.S. Older Population," Working Paper, October 2004.

<sup>6</sup> Heiss, Florian, Axel Boersch-Supan, Michael Hurd and David Wise, "Pathways to Disability," Working Paper, September 2004.

<sup>7</sup> Landrum, Mary Beth and Kate Stewart, "Pathways to Disability," Working Paper, October 2004.

***Health Conditions that Lead to Disability.*** A third line of our research focuses on the disabilities associated with specific health conditions. This is important, because different chronic illnesses account for a different proportion of disability in the population, different forms of disability, and different improvements in disability over time. For example, very specific medical advances (such as cataract surgery, or anti-depressant medication, or beta blockers, or hip replacements) may have been most important for specific health conditions, or specific functional disabilities. Thus understanding the pathways to disability from specific health diagnoses, and how those pathways have evolved over time, is critical to understanding the deeper causes of disability decline. To date, this line of research has focused on arthritis, cardiovascular disease, obesity, and depression; and their unique influences on disability trends. Highlights from our initial research in this area include:

- David Cutler's research looks at the role of improvements in cardiovascular disease in disability decline. Depending on the causal definition used, he finds that between 5.3 and 10.1 percent of people age 70 and older were disabled in 1989 as a result of cardiovascular disease (out of 30.3 percent of all people age 70 and older who were disabled). By 1999, he finds that between 4.1 and 8.0 were disabled as a result of cardiovascular disease, a reduction of between 1.2 and 2.1 percentage points. That means that between 19 and 33 percent of the overall decline in disability rates can be attributed to declining disability from cardiovascular disease.<sup>8</sup>
- Rena Conti, Ernst Berndt and Richard Frank focus on mental illnesses. Since the early 1990s, mental illnesses have become the fastest growing cause of disability insurance claims, making up 30% of DI awards in 2000. These investigators find that depression alone induces some DI applications. In addition, depression often works in combination with other medical illnesses and widowhood to increase DI applications. Thus the interactions between mental illness, physical illness and life events is identified as a very important area for further analysis.<sup>9</sup>
- A historical study by Dora Costa focuses on the long-term effects of untreated infectious disease and physical injuries on chronic disease and disability. She finds that past occupation was an important determinant of heart disease, and joint and back problems. More economic resources and less physically demanding jobs helped to protect against mechanical wear and tear on the body, as well as avoiding the infectious diseases spread through overcrowded housing. Related work by Paula Canavese and Robert Fogel looks at the historical decrease in arthritis, identifying the combined influences of public health, medical advances, lifestyle, and job characteristics, as they have changed over time.<sup>10</sup>
- Finally, Suzanne Leveille, Christina Wee and Lisa Iezzoni focus on obesity. Because obesity often leads to arthritis, they draw attention to the increasing obesity in the population, and the possibility that obesity trends could lead to more frequent arthritis diagnoses, as well as the potential mobility impairments associated with arthritis.<sup>11</sup>

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<sup>8</sup> Cutler, David, "Cardiovascular Disease and the Reduction in Disability," Paper in Progress, October 2004.

<sup>9</sup> Conti, Rena, Ernst Berndt and Richard Frank, "Retirement and Disability Trends: Exploring the Impact of Depression," Working Paper, September 2004.

<sup>10</sup> Canavese, Paula and Robert Fogel, "Arthritis: Changes in Its Prevalence During the 19<sup>th</sup> and 20<sup>th</sup> Centuries," Working Paper, September 2004, and Costa, Dora, "Hearts, Joints, and Mind: Why Were Older Men in the Past in Such Poor Health," Working Paper, October 2004.

<sup>11</sup> Leveille, Suzanne, Christina Wee and Lisa Iezzoni, "Are Baby Boomers Aging Better or Just Longer? Trends in Overweight, Obesity, and Arthritis, 1971-2002," Working Paper, October 2004.

***Economic and Labor Market Implications of Disability Decline.*** The fourth line of our research deals with the economic and labor market implications of disability, and the benefits of disability decline. This circles back to the important motivations for disability decline that we described in the introduction, and the substantial benefits to society of extending or accelerating disability declines into the future. For example, what benefit can we expect from enabling people to stay in the workforce longer? What benefits can we expect from reduced medical costs and reduced caregiving costs from a more healthy older population? What benefits can we expect to government programs (such as Disability Insurance, Social Security, Medicare, and Medicaid) that provide income and health care support to those who are disabled? And finally, what is the economic return on investments in medical care technology and pharmacology that improve health and functional ability. Our research on this last issue suggests benefits of investments in medicine and health that far exceed their cost.

In follow-up research going forward, we plan an increased focus on the relationship between disability and medical expenditures. The issue is complicated by the complexity of the causal relationships between them. On the one hand, medical spending may be an important causal factor in improving functional health. In other words, medical spending may “buy” declining disability. On the other hand, those who are less disabled appear to spend less on medical care, at least in the short-term, than those who are more disabled. So from this direction, better functional health may lead to reduced medical spending in the population. Both factors are almost certainly part of the relationship, and disentangling them is an important objective of our continuing effort.

Highlights from our initial research on the economic and labor market implications of disability decline include:

- Nicholas Christakis and Paul Allison have undertaken a research agenda on the “externalities” of health and disability on caregivers and others who may be affected by those who are ill or functionally impaired. They hypothesize that the process of caregiving for a loved one, the process of sharing in the illness of a loved one, and even the process of dying have spillover effects from one person to another. The implication is that improvements to health and functional ability have a multiplier benefit well beyond the individuals affected directly. To begin to develop evidence on this issue, Christakis and Allison look at the effect of serious illness on the health and mortality of spouses, finding that certain serious illnesses can have a significantly detrimental effect on the spouses of those who become ill or functionally impaired.<sup>12</sup>
- Mark Duggan and Scott Imberman look at the causes of increasing disability claims among the working age population. During the last two decades, the fraction of non-elderly adults receiving Social Security Disability Insurance benefits increased by 76 percent. They find the most important factor to be more liberal medical eligibility criteria, which explains an estimated 38 percent of the increase for women and an estimated 53 percent of the increase for men. Other factors were the income replacement rates in the program, economic conditions, work history (eligibility for DI), and the age structure of the population.<sup>13</sup>

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<sup>12</sup> Christakis, Nicholas and Paul Allison, “Inter-Spousal Mortality Effects: Caregiver Burden Across the Spectrum of Disabling Disease,” Working Paper, October 2004.

<sup>13</sup> Duggan, Mark and Scott Imberman, “Why Are the DI Rolls Skyrocketing? The Contribution of Population Characteristics, Economic Conditions, and Program Changes,” Working Paper, September 2004.

- Michael Chernew, Dana Goldman, Feng Pan, and Baoping Shang have initiated work on the relationship between disability trends and health care expenditures. Their initial work finds greater relative increases in medical spending among those who spend less, as compared with those who spend more. Continuing work on this topic will look at trends in lifetime medical expenditures, and how lifetime expenditures relate to disability trends.<sup>14</sup>

Amitabh Chandra and Andrew Samwick look at the decline in disability in the working age population over the past two decades. In the early 1980s, disability rates of working age men were about two percentage points higher than those of women. But over the period from 1980 to 2003, Chandra and Samwick find a substantial decline in work limiting disability among men, but not for women, so that men and women now have similar disability rates at the end of their working lives. For men, the declines are particularly significant among those age 55 to 64, rather than at younger ages.<sup>15</sup>

Looking ahead, three sets of issues form the core of our research agenda going forward.

(1) One is the important role of education in disability trends. Across many of the investigations completed to date, education is consistently found to be a contributing factor to disability trends. Why education is so important to the likelihood of becoming disabled, and what the strong relationship suggests for future disability trends, warrants more intensive study. (2) The second is the implication of disability trends on work. To what extent might we expect declining disability, in conjunction with modifications to retirement policies, to change work and retirement behavior at older ages? And what are the economic implications of these changes. (3) The third, as noted above, is to disentangle the complex inter-relationship between medical costs and disability, including both the role of medical advances and medical spending in reducing disability; and the potential role of reduced disability in reducing medical costs.

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<sup>14</sup> Chernew, Michael, Dana Goldman, Feng Pan, and Baoping Shang, "Disability and Health Care Expenditures Among Medicare Beneficiaries," Working Paper, September 2004.

<sup>15</sup> Chandra, Amitabh and Andrew Samwick, "Disability and Work over the Life Cycle," Working Paper, September 2004.